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THE BOWELS.

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SOMETIMES a patient will come hastily into your office, and, with an air of great mystery, unfold a piece of paper in which there lies "something that came from his bowels this morning." He will call it a worm, and it will remain for you to decide the nature of the substance, the gravity of the condition, and, finally, the treatment that is to be pursued.

If the mysterious something resembles a large earthworm in shape and measures from four to fourteen inches in length, the diagnosis is easily made. It is a lumbricoid worm. Its color may be white or dark brown, or any tint between the two. These worms seldom produce serious symptoms, and they are usually removed with ease. Still, several cases of appendicitis have been reported in which a mass of these round worms, lodged in the cæcum, has seemed to have caused the trouble.

The substance passed may consist of long, white strings or tangled masses, which, when unrolled, are found to consist of flattened, tape-like strips of a material resembling soft macaroni. The width of the strip usually varies from one-fourth to one-half inch, and the thickness is about one-sixteenth of an inch. This is probably a tapeworm, in which case the following characteristic features will be found (Fig. 1): The tape is made up of distinct segments or links which are uniform in size and shape in the different parts of the worm. In the portion of the worm that is usually thrown off, the lower end or tail portion, each link measures one-half or three-fourths of an inch in length. Each link is slightly concave and broadened at one end, and somewhat narrowed and convex at the other end.

The convex end of one link fits closely into the concave end of the adjoining link, giving one the impression of a succession of joints. The worm breaks readily at these joints, but it requires considerable force to tear through the substance of a link. Along one side of each mature or tail link there is a small projection or knob; this represents the sexual organs of the worm. Each link contains both male and female organs. The greater part of the link is occupied by a many-lobed uterus which is packed with eggs. It is

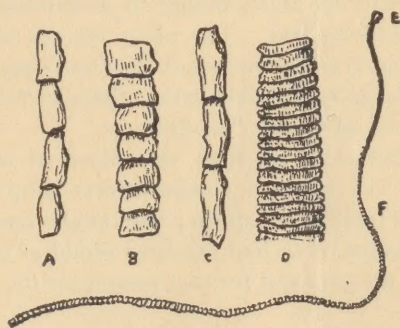


FIG. 1.

said that each link contains thirty-five thousand eggs.

The characteristic features of the "joints" or segments of a tapeworm, are pictured in Fig. 1. A and C represent the tail segments that are commonly found in the stools or the underclothing of the patient. One sees at a glance that the joints are very distinctly marked one from another and that each joint has on one margin a minute projection, the genital papilla.

B, in Fig. 1, represents an odd form of tail-



joint shed by a worm that was recently removed by the writer. D shows the immature segments from the central portion of a tapeworm. At F there is drawn the wonderfully slender neck, and at E is the minute head upon the preservation of which the life of the whole worm depends. The object of all effective tapeworm treatment is the destruction or removal of this minute head.

The reader will remember that a tapeworm grows from the head downward, new segments being constantly added just behind the head. By the development of new segments, the older ones become separated farther and farther from the head. In the central portion of the worm, these segments become larger (D) and finally take on the characteristic form of the tail segments. The tail segments are continually being shed, and their passage from the bowel constitutes the only reliable symptom of tapeworm.

By this process of shedding off at one end and constant reformation at the other, the worm maintains a definite length. This length is usually twenty-five feet, though it sometimes is as much as forty feet. The older records abound in accounts of tapeworms of fabulous length, one of the most remarkable being related in Watson's "Practice of Physic," as follows :

"Vandoverer declares that after an emetic, one of his patients vomited forty Dutch ells (ninety feet) of the worm ; and might have got rid of more 'if he had not been afraid of puking out all his guts and for that reason bit the worm off.'"

Generally speaking, the treatment of tapeworm can never be regarded as successful until the head of the parasite is found. Physicians are prone to boast of the removal of twenty or thirty feet of a worm, unmindful of the fact that unless they have removed or killed the head of the parasite, they have not benefited the patient a particle. If violently disturbed by purgatives or tæniacuges, the head of the worm will part with everything to save itself. Tail, body, and neck may be washed away, but the head takes firm hold of the intestinal mucous membrane and clings there until the storm is over. Then the formation of new segments goes steadily onward

until the worm attains its proper length, the completion of growth being indicated by the reappearance of segments with the stools.

At times, after a course of vigorous treatment, the head of the parasite cannot be found in the discharges. In the writer's experience, if four months elapse after such removal with no reappearance of segments, the worm may be regarded as dead or removed. The reason for adopting this period of time is that the living worm will grow to its full length in three months, at the end of which time segments will be again thrown off. If no segments appear, it is safe to assume that the worm has disappeared. If a worm dies in the alimentary canal, it is digested and probably absorbed.

It may be considered the rule that a tapeworm will never disappear spontaneously, or at least not for many years ; it will remain for a long time unless forcibly removed from its abode. One case has come under the author's notice in which the patient, a woman, refused to have the worm expelled, as its presence gave her no discomfort. After twenty years, the joints appeared in the stools no longer. The worm had apparently lived its allotted span of years and died a natural death, comfortably, in its own bed.

In the writer's experience, these parasites cause very little disturbance. With children, there may be troubled sleep, with grinding of the teeth or disturbed digestion and that irritability of temper and body that is generally described as "nervousness." On the other hand, with an adult, the only annoying feature is the consciousness that there is a worm inside of him. It should not be forgotten, however, that there are such phenomena as intestinal reflexes and that cases of supposed epilepsy, chorea, and other nervous disorders have been cured by the removal of an intestinal parasite.

The gross appearances of the parasite are easy to be recognized, especially after they have been once seen. The diagnosis of tapeworm should never be made unless the links can be distinctly made out, for there are other conditions in which long, white strings and masses are passed from the bowels.

One disease that has been mistaken for tapeworm by the uninitiated is pseudo-membranous enteritis. In this disease, long shreds of white or yellowish membrane are thrown off (Fig. 2).

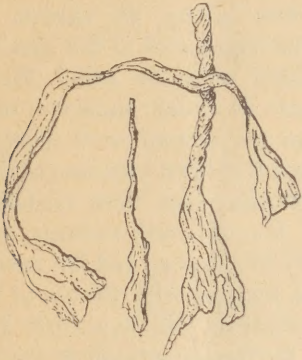


FIG. 2.

They may appear in the form of tubes, which are casts of the intestine, or the membrane may be twisted into a thick cord of considerable length. This cord may even be flattened like a tapeworm, but the membranous cord never presents the linked structure of tapeworm, nor has it the small lateral knobs, the sexual papillæ. The masses of membrane can nearly always be unrolled in a thin sheet, which differs from the thick, pulpy tapeworm. The final test is the microscopical examination. On placing the thinnest possible piece of the membrane in a drop of glycerine and examining it with a power of three hundred or five hundred diameters, it will be found to consist of a mass of nucleated cells of various shapes and sizes (Fig. 3). Some

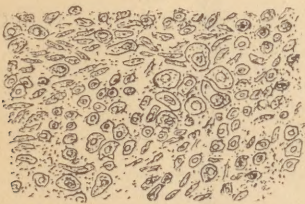


FIG. 3.

of the cells resemble the columnar cells of the intestinal mucosa, while groups of large round cells are frequently seen. The cells are adherent to a clear or granular structureless membrane,

which seldom resembles the fibrinous network of the usual croupous exudation. Pieces of the membrane may be hardened in chromic acid or in alcohol, stained and mounted in glycerine or balsam.

Opinions differ as to the nature of the disease. While, on superficial examination, it appears to be a croupous inflammation, the exuded material differs microscopically and chemically from a croupous exudate. Instead of fibrin, the extruded intestinal membrane consists principally of mucin. Pseudo-membranous enteritis, then, is a peculiar disease, characterized by the formation of a peculiar exudate.

While the patient with tapeworm seldom complains of local symptoms, in pseudo-membranous enteritis the patient suffers from frequent intestinal disturbances, as diarrhea, constipation, and abdominal discomfort. Once a week, once a month, or at longer intervals, there occur par-

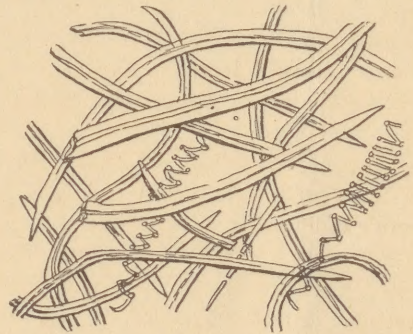


FIG. 4.

oxysms of intense abdominal pain, which continue for several days or a week, and are only relieved by the passage of the characteristic membrane.

Another foreign body that emerges from the human intestine is the *oxuris vermicularis*, the threadworm or pinworm. It is a small white or yellowish worm, about half an inch in length, and is most commonly found in children and infants.

There have been a few cases recorded in which the patient passed from the rectum small masses of white pulpy substance that consisted entirely of vegetable fiber. Several curious instances are related where this discharge con-

tinued long after the patient had ceased to partake of vegetable food. In those cases that have come under the author's notice, the extruded material closely resembled a roll of paper that had been chewed and subsequently squeezed dry. This substance can be readily recognized by its appearance under the microscope as shown in Fig. 4. A small piece of it is teased as finely as possible on a glass slide and a drop of glycerin and a cover-glass are applied. A power of three hundred or more diameters will demonstrate the ordinary vegetable fibers, the plant hairs, and the spiral fibers.

It should be remembered that in acute intestinal catarrh, masses of jelly-like mucus are voided either alone or accompanied by fecal matter. The mucus is slimy, viscid, and colorless. It should not be mistaken for the comparatively

tough, white, twisted cords and shreds of pseudo-membrane.

In conclusion, the student should make it a rule to examine microscopically any suspicious or strange substance that is passed from the bowels, before giving an opinion upon its nature. The importance of this precaution will be appreciated when we recall Virchow's report of a case in which masses of orange peel voided from the rectum were mistaken for a parasite; and Eichhorst's account of the bunches of asparagus fiber that were mistaken in the same way. It is believed, however, that, with a careful study of the text, and the accompanying illustrations, together with the use of the microscope, the students will have little difficulty in identifying the foreign substances that at various times are passed from the bowels.

